The Fiberlink 3353 Series converts broadcast quality 3G/HD/SD-SDI transmitted over one single mode or multimode fiber to HDMI with or without embedded audio.

Fiberlink®
3353 Series

3G/HD/SD-SDI to HDMI Optical Receiver

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Welcome

Thank you for purchasing Communications Specialties, Inc.'s Fiberlink® 3353 Series. The 3353 Series is used to convert 3G/HD/SD-SDI with or without embedded audio transmitted over a single fiber optic core to HDMI. The Fiberlink 3353 Series is compatible with single mode or multimode fiber. The 3353 is also compliant with SMPTE 297-2006 for seamless interoperability with other SMPTE 297-2006 devices. The system delivers noise-free transmission that retains all of the signals' initial parameters, regardless of fiber optic cable attenuation. The 3353 Series also provides immunity to video pathological signals over the entire link budget and operating temperature range.

Features

- Convert 3G/HD/SD-SDI with embedded audio to HDMI with audio pair selection
- Supports all SD and HD resolutions to 1080p/60
- Fully SMPTE 297-2006 compliant fiber input
- HDMI embedded and stereo line level outputs (if audio present in SDI stream)
- Re-clocked SDI BNC output allows for continuous 3G/HD/SD-SDI signal distribution
- User selection from up to 8 audio channel pairs for multilingual or multimessage support
- Automatic selection of output resolution - no scaling
- ST and LC fiber connector options
- Small compact design
- Compatible with Fiberlink 3350, 3360 & 3380 Series, Fiberlink Matrix and Scan Do® HD's optical output.

Package Contents

- One Fiberlink® 3353
- This User's Manual

Technical Specifications

Model Part Number Specification	
Unit Type	**Part Number**
Receiver Box	3353-B7L (LC) 3353-B7S (ST)
General Specifications	
Indicators	Power, Alarm, Data Rate Lock (3G, HD, SD)
Box Version Dimensions	6.5 W x 1.15 H x 6 L (inches) 165 W x 29 H x 152 L (mm)
Weight	16 ounces, 453.5 grams
Power	9-24 volts, AC or DC, 5.5 watts
Operating Temperature	-10° C to +50° C
Fiber Optic Input	
SMPTE 297-2006 Labeling	PC-ABCD-1310-1550
Connector	LC receptacle, PC polish or ST
Wavelength	1100 - 1620 nm
Minimum Input Sensitivity	-17 dBm at 2.97 Gbps; -20 dBm at 1.485 Gbps -23 dBm at 270 Mbps;
Maximum Input Power	0 dBm
Video Output	
Number of Outputs	1
Connector Type	HDMI Female
Signal Format	Single link HDMI with embedded audio, RGB or YCrCb as negotiated with display
Resolutions Supported	All 3G/HD/SD-SDI formats from standard definition to 1080p/60
3G/HD/SD-SDI Output	Standard, Follows fiber optic input
HDCP Compliant	Yes. SDI signals, by definition, are not encrypted

Technical Specifications

Audio Output

Optical Input

Number of Audio Channels	2 channels, unbalanced, line level 2 channels embedded in HDMI signal
Audio Connector	RCA Jacks
Switches	Front panel selection of one of 8 audio channel pairs on SDI signal to output

NOTE: Audio on HDMI and line level are available simultaneoulsy and extracted from audio embedded within SDI signal in accordance with SMPTE standards.

3G/HD/SD-SDI Output

Signal Level	800mV ± 10%
DC Offset	0V ± 0.5V
Rise/Fall Time	< 135 ps at 2.97 Gbps per SMPTE 424M; < 270 ps at 1.485 Gbps per SMPTE 292; 0.4 ns to 1.5 ns at 270 Mbps per SMPTE 259M
Overshoot	< 10% of amplitude
Timing Jitter	< 0.2 UI at 270 Mbps; < 1.0 UI at 1.485 Gbps; < 2.0 UI at 2.97 Gbps with color bar signal
Alignment Jitter	< 0.2 UI at 270 Mbps; < 0.2 UI at 1.485 Gbps; < 0.3 UI at 2.97 Gbps with color bar signal
Re-clocking	At 270 Mbps, 1.485 Gbps & 2.97 Gbps

Installation Instructions

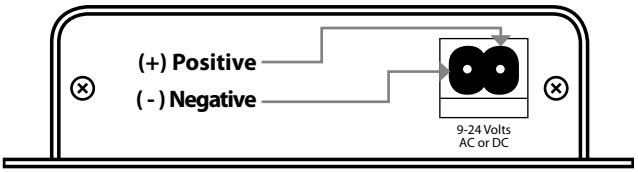
The Fiberlink® 3353 Series of fiber optic transmission systems are ready for immediate use and do not require any special tools. However, an Optical Power Meter, such as the Fiberlink® 6615, can be useful in determining optical loss budgets during your systems design and maintenance.

Fiberlink® 3353 will operate with the Fiberlink 3350, Fiberlink 3360, Fiberlink 3370, Fiberlink 3380, Scan Do® HD, Fiberlink Matrix and SMPTE 297-2006 compliant optical tranmission units. The following procedure presumes you have followed the instructions for installing your optical transmitter unit.

The following instructions describe the typical installation procedure:

1) Connect the fiber optic cable to the optical input of the receiver unit.
2) Connect the video output cable (HDMI) to the video output HDMI connector on the receiver unit.
3) Optionally connect any audio cables and using the channel pair rotary selector, choose your desired audio output channel. Audio is also embedded on the HDMI cable.
4) Terminate any unused BNC output connector at 75 Ohms.
5) Connect the Universal Power Supply to the transmitter and receiver units. Please refer to figure 1.
6) When power is applied, the green POWER LED should illuminate, indicating the presence of operating power. The 3G/HD/SD RATE LED will give an indication as described in the Indicator LED's and Alarm Circuitry section of this manual.
7) The system should now be operational.

Figure 1:
Power Connector
DC Input Polarity



The transmitting element in the Fiberlink® 3350, 3360, 3370 and 3380 transmitter units contains a solid state Laser Diode located in the optical connector. This device emits invisible infrared electromagnetic radiation which can be harmful to human eyes. The radiation from this optical connector, if viewed at close range with no fiber optic cable connected to the optical connector, may be sufficient intensity to cause instantaneous damage to the retina of the eye. Direct viewing of this radiation should be avoided at all times!

Audio Pair Selection

The Fiberlink® 3353 Series has a rotary dial switch that allows you to select which audio pair to output. The chart below describes the operation of the rotary switch positions:

Rotary Switch Positions

Position	Function
0	Will mute the audio output
1 through 8	Will output the respective audio channel pair on the HDMI cable and the audio output connectors
9	Not used

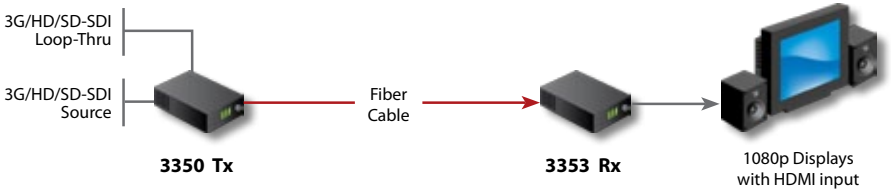
Indicator LEDs

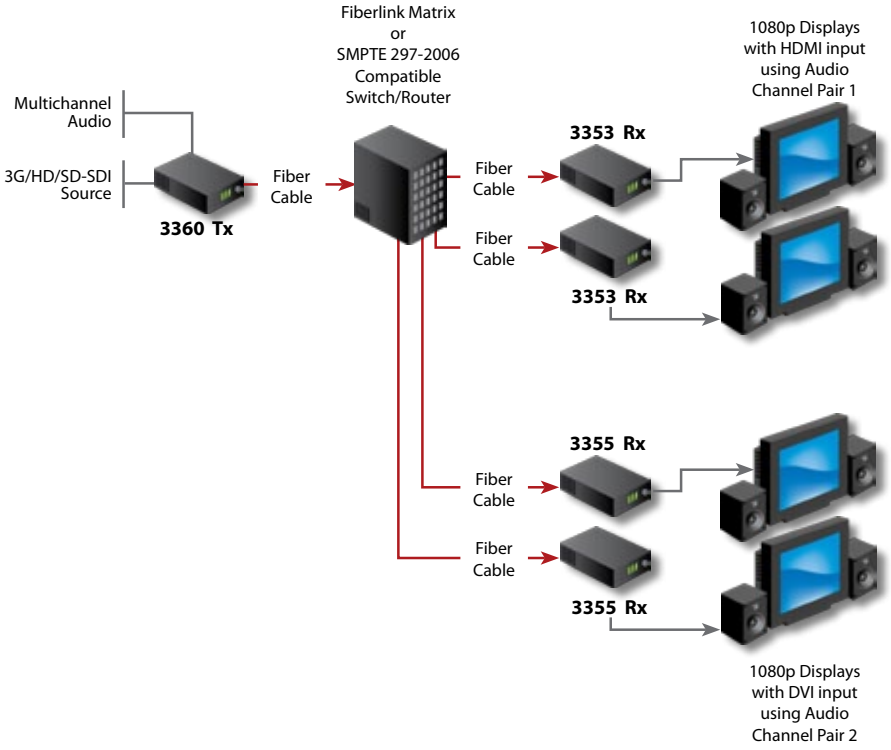
The Fiberlink® 3353 Series has four integral indicator LEDs that are used to monitor the state of the unit.

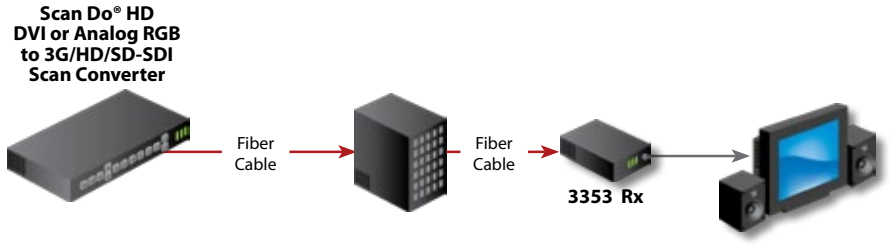
Receiver LEDs

LED	Status	Definition
Power	On	Indicates that correct power has been applied.
3G Rate	Off On	Indicates no 3G-SDI data rate lock Indicates 3G-SDI data rate lock at 2.97 Gbps or 2.97/1.001 Gbps
HD Rate	Off On	Indicates no HD-SDI data rate lock Indicates HD-SDI data rate lock at 1.485 Gbps or 1.485/1.001 Gbps
SD Rate	Off On	Indicates no SD-SDI or DVB-ASI data rate lock Indicates SD-SDI or DVB-ASI data rate lock at 270 Mbps
Alarm	On	Loss of optical signal

Note: The 3G, HD and SD LEDs indicators are off when a non-standard signal is applied.


3G/HD/SD-SDI
Loop-Thru
3G/HD/SD-SDI
Source
Fiber
Cable
3350 Tx
3353 Rx
1080p Displays
with HDMI input


Fiberlink Matrix
or
SMPTE 297-2006
Compatible
Switch/Router
1080p Displays
with HDMI input
using Audio
Channel Pair 1
Multichannel
Audio
3G/HD/SD-SDI
Source
3360 Tx
Fiber
Cable
3353 Rx
3353 Rx
3355 Rx
3355 Rx
1080p Displays
with DVI input
using Audio
Channel Pair 2


Scan Do® HD
DVI or Analog RGB
to 3G/HD/SD-SDI
Scan Converter
Fiber
Cable
Fiber
Cable
3353 Rx

Operating Pointers

Remember to check attenuation of the fiber optic cable. The system will only operate properly if these specifications fall within the range of the system's loss budget.

Note: If no signal is applied to the 3353 Transmitter, no optical power will be present on the 3353 Transmitter's output.

Troubleshooting

Multimode fiber optic cable contains an optical fiber with a light carrying "core" that is only .0025 inches (62.5 microns) in diameter. Single mode fiber optic cable has an even smaller "core," only .00032 to .0004 inches (8-10 microns). This is smaller than a human hair! Therefore, any minute particles of dirt or dust can easily block the fiber from accepting or radiating light. To prevent this from happening, always use the provided dust caps when ever optical connectors are exposed to air. It is also a good idea to gently clean the tip of an optical connector with a lint-free cloth moistened with alcohol whenever dust is suspected.

The status of the LEDs should provide the first clue as to the origin of any operational failure. If these are off, it usually means that the fiber is broken or has too much attenuation. Next, be certain that the input and output signal connections are correct.

An optical power meter, such as the Fiberlink® 6615, a visible light source, such as the Fiberlink® 6610, and a Three Wavelength Light Source, such as the Fiberlink® 6620, can greatly assist and expedite troubleshooting of fiber optic transmission systems and are recommended tools all installers should have available.

Finally, although multimode and single mode devices may look the same, they will not operate properly together. Using the wrong device or fiber can easily add more attenuation than specified, resulting in poor overall performance. It should be noted that some of our fiber optic products support both single mode and multimode fiber in the same unit.

If, after reviewing the above possibilities, the system is still not operating, please contact the Customer Service Department for further assistance. If you suspect your problem is caused by the optics or the fiber optic cable, and you have an optical power meter, please take the appropriate measurements prior to contacting support.

Maintenance and Repairs

The Fiberlink® 3353 Series has been manufactured using the latest semiconductor devices and techniques that electronic technology has to offer. They have been designed for long, reliable and trouble-free service and are not normally field repairable.

Should difficulty be encountered, Communications Specialties maintains a complete service facility to render accurate, timely and reliable service of all products.

The only maintenance that can be provided by the user is to ascertain that optical connectors are free of dust or dirt that could interfere with light transmission and that electrical connections are secure and accurate. Please see the Troubleshooting section of this manual for additional information.

An optical power meter, such as the Fiberlink® 6615, a visible light source, such as the Fiberlink® 6610, and a Three Wavelength Light Source, such as the Fiberlink® 6620, can greatly assist and expedite troubleshooting of fiber optic transmission systems and are recommended tools all installers should have available.

All other questions or comments should be directed to our Customer Service Department. It should be noted that many "problems" can easily be solved by a simple telephone call.

If you suspect your problem is caused by the optics or the fiber optic cable, and you have an optical power meter, please take the appropriate measurements prior to contacting support.

Certifications

Communications Specialties, Inc. (CSI) warrants that, for a period of three years after purchase by the Buyer, this product will be free from defects in material and workmanship under normal use and service. A Return Material Authorization (RMA) number must be obtained from CSI before any equipment is returned by the Buyer. All materials must be shipped to CSI at the expense and risk of the Buyer.

CSI's obligation under this warranty will be limited, at its option, to either the repair or replacement of defective units, including free materials and labor. In no event shall CSI be responsible for any incidental or consequential damages or loss of profits or goodwill.

CSI shall not be obligated to replace or repair equipment that has been damaged by fire, war, acts of God, or similar causes, or equipment that has been serviced by unauthorized personnel, altered, improperly installed, or abused.

RMA numbers and repairs can be obtained from:

Communications Specialties, Inc.
55 Cabot Court
Hauppauge, NY 11788 USA
Tel: (631) 273-0404
Fax: (631) 273-1638

or, in the Asia Pacific Region:

Communications Specialties Pte Ltd
100 Beach Road
#22-09 Shaw Tower
Singapore 189702
Tel: +65 6391 8790
Fax: +65 6396 0138

RMA numbers can also be obtained from our web site: **commspecial.com**

Please have your serial number available.

Fiberlink® 6610 Visible Light Source

The Fiberlink® Visible Light Source provides a visible 650 nm laser output that can be used for identifying fiber breaks and individual fibers within fiber bundles, allowing for convenient, on-site testing of fiber networks during construction and maintenance procedures.

Fiberlink® 6615 Optical Power Meter

The Fiberlink® Optical Power Meter measures the power of optical signals at 850, 980, 1310 and 1550 nm wavelengths, allowing for convenient, on-site testing of fiber networks during construction and maintenance procedures. It can be used to measure the power of an optical signal reaching the receiving end of a fiber optic cable, as generated either by a transmitter unit or by a light source such as the 6620.

Fiberlink® 6620 Three Wavelength Light Source

The Fiberlink® Three Wavelength Light Source offers a laser output at wavelengths of 1310 and 1550 nm and VCSEL output at 850 nm, allowing for convenient, on-site testing of fiber networks during construction and maintenance procedures.

Fiberlink® 3360 3G/HD/SD-SDI & 4 Pair AES Audio Series

The Fiberlink® 3360 Series allows you to transmit 3G, HD or SD-SDI as per SMPTE 424M-2006, 292 and 259 with the ability to embed up to 8 channels (4 pairs) of AES/EBU digital audio. Convenient switches on the 3360 Series transmitter allow the operator to embed each of the four pairs of audio independently, to strip previously serialized audio, or to pass it through without modification. At the receive end of the fiber optic link, the operator can decide which audio pairs they need de-embedded.

Audio signals are not required to operate the Fiberlink® 3360 link and it can be used as a stand-alone 3G/HD/SD-SDI optical link. Previously serialized data is left intact throughout the entire transmission process and the 3360 Series is immune to pathological signals over the entire budget link and operating temperature range.

Signals are equalized and re-clocked prior to fiber optic transmission and the 3361 receiver features a re-clocked SDI output.

The 3360 Series is compliant with SMPTE 297-2006 and has the ability to operate seamlessly with Fiberlink® Matrix and other SMPTE 297-2006 fiber optic compliant devices.

Available in card versions and a small footprint box version, it is ideal for broadcast or corporate studios, OB vans, rental and staging, auditoriums, stadiums and theaters, airport or transportation hubs, distance learning, surgical or medical imaging and more

Learn more at commspecial.com

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